

Clouds Second

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MCEN 4043: Clouds Second

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I. INTRODUCTION

This is the trailing end of a storm that dropped about 5" of snow on the Boulder area on November 27, 2022. 5 hours before this image was taken I was driving through north Boulder to Jamestown and was driving through these clouds. Around 3 pm, I took this image and the clouds had lifted and were leaving the mountains. I like how ominous and foreboding the clouds are over the brightly lit neighborhood.

II. CIRCUMSTANCES

This image was taken in North Boulder at approximately 5,600' at the Fourmile Canyon Creek Trailhead. I was pointing to the northeast, and my camera was nearly perpendicular to the horizon. The image was taken 3:05pm, so the mountains were beginning to shade the Front Range.

III. PHENOMENON

This image captures the receding edge of the alto-stratus layer of a storm system. Storms in the mountains begin when the warmer, moister, less dense air is displaced by the cooler drier air of a cold front. The warm air rises and then then condenses into clouds. As the cool denser air goes between the warm air layer, an instability occurs. On this day, there wasn't much wind but the days since there has been considerable wind, likely due to the instabilities that come from the cold fronts coming over the mountains.

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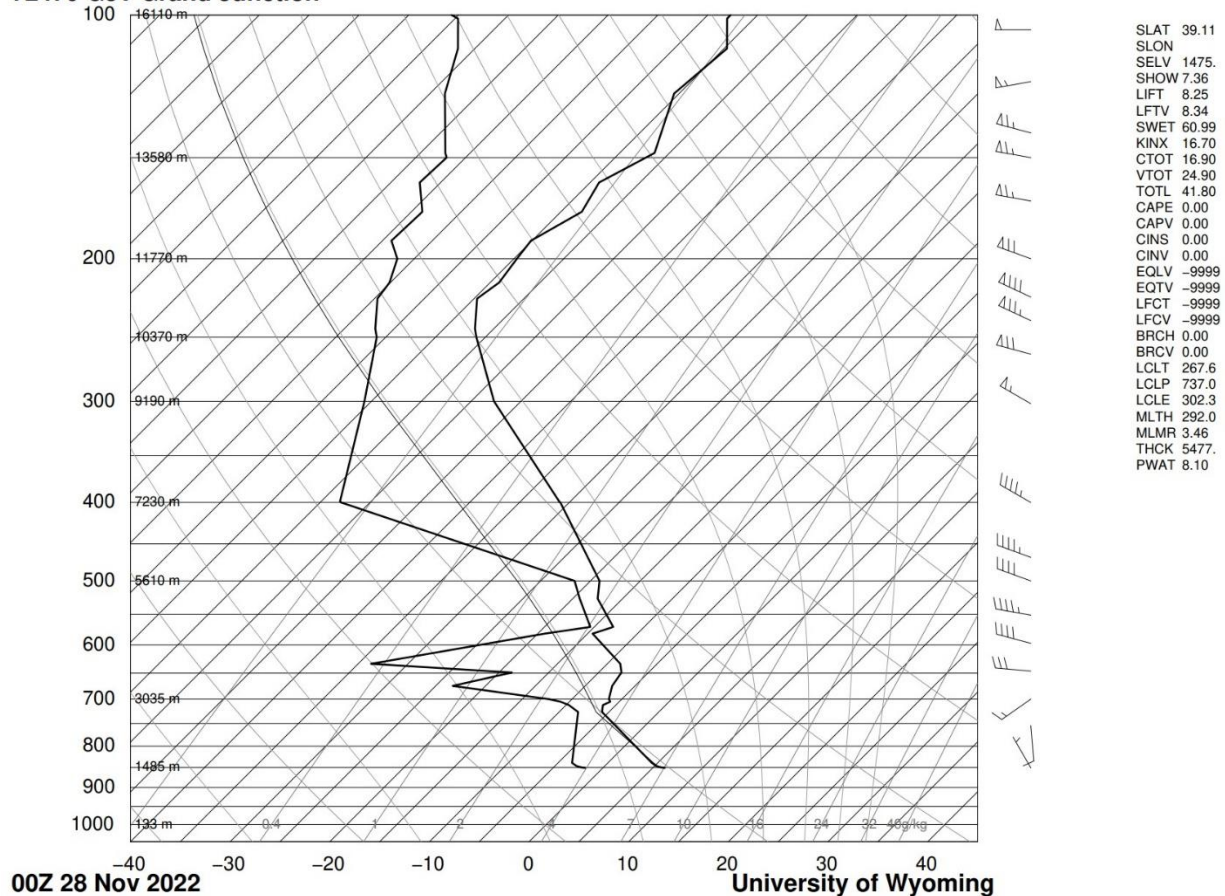


Figure 1. A Skew-T plot that shows a bottleneck from 4500 to 5510 m.

The Skew-T plot shows a distinct cloud layer occurring between 4500 m to 5510 m. This supports the fact that this is an alto-stratus cloud layer. The lower layer of clouds in the stack occurs at the other bottle neck at about 3000 m. Since the storm system is moving away and to the east, the atmosphere is stable and this is supported by the fact that the CAPE is 0.

IV. PHOTOGRAPHIC TECHNIQUE

I tried to take this image out of the car window on the side of the road a few times before I pulled into a parking lot to take this image. The houses in the neighborhood are approximately $\frac{1}{4}$ mile away from where I was taking the picture. The field of view is approximately 80' x 80', and the houses are used for scale. I took this photo with my iPhone X dual back camera. The settings are seen in Table 1, below.

Table 1: Camera settings and their values

Setting	Value
Aperture	f/1.8
ISO	25
Focal Length	4 mm
Exposure	1/3572
Sensor	12 MPx
Original Image Size	4032 px x 3024 px
Final Image Size	2911 px x 3698 px



Figure 2. The unedited image includes a no parking sign in the middle of the image, which was edited out in the final image.

Figure 2 shows the unedited image. In the final image I increased the saturation, so the house colors popped more, and I edited out the signpost, so it looks less like the photo was taken on the side of the road.

V. IMAGE

This image shows the amazing clouds and storms that pass over the Front Range, especially in the winter. I am proud of this image because it tells a story. The dark clouds over a brightly lit neighborhood are ominous and foreboding, but the neighborhood looks almost like its out of a story book. In the future, I hope to continue to use photography convey feelings, like this image does.

VI. APPENDIX

a. Bibliography

“Clouds 1: Names.” *Flow Visualization*, <https://www.flowvis.org/Flow Vis Guide/clouds-1-names/>.

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